



ACTIVITY BASED TEACHING IN ENGINEERING EDUCATION

P. Subhashitha¹ | B. Sujatha²

¹ Assistant Professor, Electrical and Electronics Engineering, BVRIT Hyderabad College of Engineering for Women, Hyderabad, India-500090

² Associate Professor, Electrical and Electronics Engineering, BVRIT Hyderabad College of Engineering for Women, Hyderabad, India-500090

ABSTRACT

Each student is unique. In a classroom of sixty members, one cannot guarantee a common skillset. In such a scenario, observing different understanding levels, learning, analysing and applying styles is quite obvious. Teaching such a diversified group, effectively, is definitely a challenging job to any teacher. In this context, one should realize that teaching and learning are different. Good teaching might not always ensure good learning. Hence, effective teaching focusses more on helping the students learn better than about a teacher to teach better. This paper throws light on the activity based education which can help the students to learn better.

KEYWORDS: Activity, Learning, Teaching.

INTRODUCTION:

From ages, teachers are considered as a bundle of wisdom and knowledge. Teaching was considered as a noble profession. Teachers play a crucial role in training a student for the next phases of life. In engineering education, the teachers are not and cannot be confined to teaching alone. In a classroom with students coming from various cultural backgrounds and with different learning abilities, the role of a teacher has quickly shifted from teaching alone to teaching, monitoring, mentoring, etc.. In the ever growing, expanding and competing lives and with one's responsibility increasing, it is essential for a teacher not to get lost in the flow and confine to name sake teaching. To ensure a better learning from the students' point of view, teacher needs to adapt new and scientific teaching practices. One of the useful approaches is activity based teaching. Activity has fun and creative side of understanding. It can be planned, either as a source for pre-requisites, to understand, analyse or apply i.e., an activity can be planned ahead, during and after the lecture on a topic. Activities can be planned for all levels blooming taxonomy.

Teaching ensures passing on the knowledge but it does not ensure learning. To ensure this, one should do a careful assessment. Assessment helps the teacher to understand the learning abilities of a student. Though not all activities need assessment, few of them can prove fruitful with right assessment.

In the next few paragraphs, activities conducted on trial basis are explained and the observations are noted.

MATERIALS AND METHODS:

Activities:

i) **Model Making:** This activity can be given to a group or a pair or to an individual. This activity helps the students appropriately in topics related to structures and constructions. The students are instructed to build a model, exhibiting all the important parts of a transformer. Students used various learning resources like text book, web material, and video lectures to first list out the important parts and then make the model. This activity improves the learning, understanding and remembering ability of the student. Not only this, the students could also elucidate neatly, without the help of any text material.



Fig. 1: Model Making

ii) **Chart Making:** Students can be given an option to work individually or in pairs or in a group of four in this activity. They can also be free to choose their topic of interest or the teacher can assign/suggest a topic. The instruction given was be creative and vivid. The students did not start away immediately, but had really serious discussions on how to make a good chart. They referred both online and offline learning resources. They developed their chart with clear understanding of the topic. It was observed that the students first aimed to understand the outcome and then devise a plan of action. This activity improved the capability of students working in teams. As all the important formulae were consolidated in a single chart, this was much useful for later when one wishes to refresh the formulae.

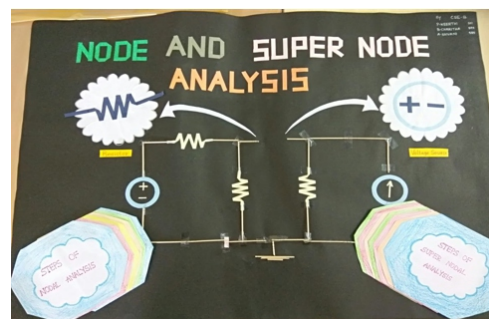


Fig. 2: Chart Making

iii) **Mind Map:** This activity is similar to chart making except that this is implemented for a unit or subject rather than a single topic. The mind map serves as a resource for overview of the course or unit. This can be group or pair or individual activity.

iv) **Tech Quiz:** This activity is fun way that can help both student and the teacher to assess the student's level of learning. With this activity, the classroom can turn into chaos, especially in a class of 60 members. But for small groups, this activity is great. It can be made inquisitive if the questions are framed using non-technical words to define technical terms. This style of questions help the students relate a technical topic a day to day phenomena or activity and hence can remember better.

v) **Reverse Dumb Charades:** This activity can be conducted to refresh definitions and concepts related to courses of previous semester. This activity is very helpful for those courses which are continued in the next semester as well. This is a group activity. Student from one group, stands on the dais facing the group, away from the board. One student from next group comes and writes down a technical word on the board. Now the first group should make their team member tell the word written on the board without using any technical words. Students find it very useful for refreshing the topics.

vi) **Word Building:** This activity is a good approach to answer the questions (particularly short answer questions) at remember and understand level. Stu-

dents can work in pairs to develop the word puzzle with definitions and hints at the bottom. Students were equally enthusiastic in answering puzzles made by other students.

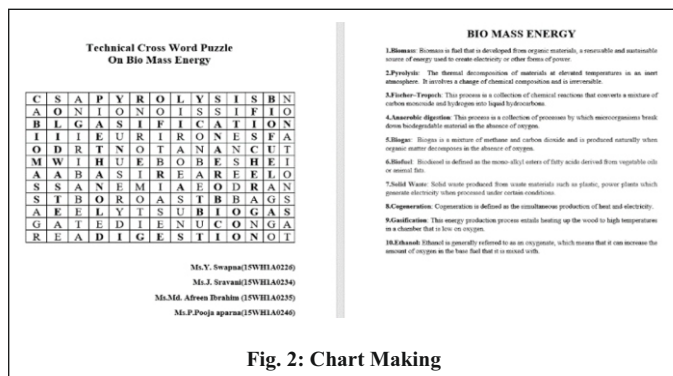


Fig. 2: Chart Making

vii) **Write & Define:** This activity can be planned at the end of a unit. Teams of 5 to 6 members each should be formed. One member from each team, in turns, should write a term on the board and define them. The words should not get repeated. By the end of the activity, the board will be filled with various terms related to the unit. The picture of this board can be used as reference when students prepare for examination. As the turns go on, the terms get lesser and the students take it as a challenge to explore every small/big term from the concerned unit.

viii) **Role Play:** Not every person is confident in expressing oneself orally. Factors like communication skill, stage fear, confidence, etc play a crucial role in this. Role play is one such activity, which helps an individual to overcome stage fear and gain confidence. This activity should be planned for selected students and organize it such the student gets the best out of it. In this activity, a team of 3 or 4 members are given a topic. Each member should enact a part of the same. This helps the student improve her confidence and oral skills. It can also be helpful in remembering overview of a topic. This activity improves the ability to work in groups.

ix) **Google Classroom:** Google classroom is a platform through which can we share important information with the students. Not only this, one can conduct quiz and objective exam. The good part is, the teacher can see, how many students took the exam and also the time each student took to answer the questions. This information is helpful in assessment of a student.

OBSERVATIONS:

1. Student's participation was more proactive in activities when compared to regular tests or discussions.
2. Students felt easy to express and understand as they were working with peers rather than faculty.
3. Students come up with their own ideas, which help them improve in critical thinking.
4. Students understand the significance of team work and inculcate the habit of discussing before implementing, which can give a better outcome.

RESULT AND CONCLUSIONS:

Activity based education has considerable advantages in engineering education. The activities can be designed to achieve all levels of bloom's taxonomy as well as to suit all categories of students. Activities can be designed to solve problems for competitive examinations, to implement small projects which helps in project based learning etc. Students indulge in activity based learning by themselves without the need of an external push. Though activities are fun for students, for the teacher, it's a great responsibility and opportunity. The success or suitability of an activity is verified only through good assessment techniques. Not all activities need assessment, though. The instructions given to the students should be vivid. The teacher should frame his/her outcome of the activity clearly. This helps a lot in the assessment. Activity paired up with assessment can lead to a better academic growth in all categories of student.

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